ENGINES at MILAN

Two-Row Radials Well Represented : Variety of Italian Liquid-Cooled Units

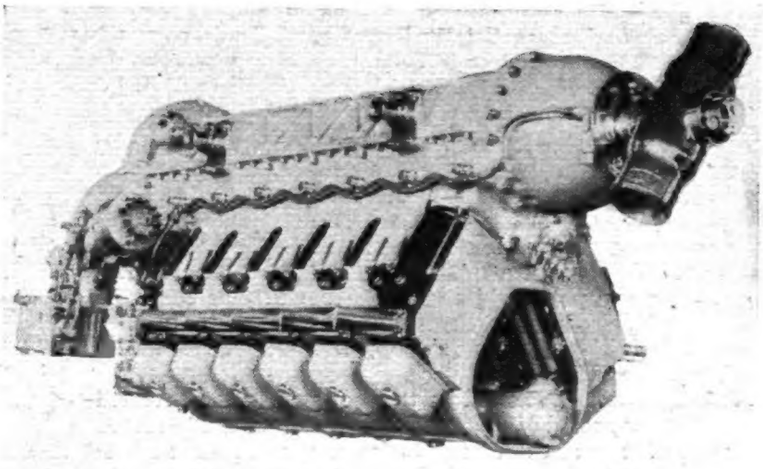
FEW countries other than Great Britain and France can show such a variety of engine types as Italy, and even though British and American manufacturers are not represented at the Milan Show, except by certain of their designs built under licence, almost every known form of engine is to be seen there.

High-powered fourteen- and eighteen-cylinder two-row radials are represented on a number of stands. One such unit, still in the experimental stage and for which no figures are divulged, is the two-row eighteen-cylinder Alfa Romeo, which looks rather a poppet-valve Hercules, or a two-row Pegasus or Mercury. The ultimate output of this engine must be in the neighbourhood of 1,500 h.p.

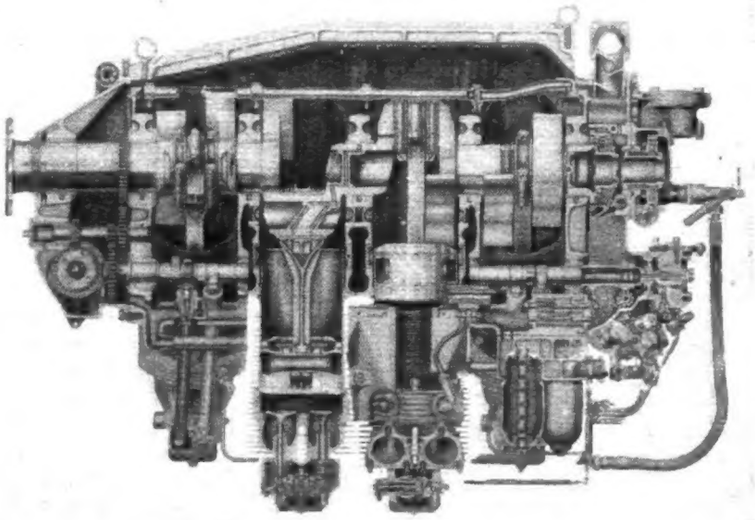
The Fiat Company show two geared and supercharged eighteen-cylinder radials, the 1,100 h.p. A 80 R.C. 20, and R.C. 41. The R.C. 41 has a rating of 1,000 h.p. at 2,100 r.p.m. at 13,450 ft. and gives 1,030 h.p. for take-off. A fourteen-cylinder engine, the A 74, R.C. 38, made by the same firm, gives 840 h.p. at 2,400 r.p.m. at 12,500 ft.

The Piaggio concern, which produced the fourteen-cylinder radial with two-stage blower for the last Italian altitude record, has a similar unit, the eighteen-cylinder P. XII R.C. 40, which delivers 1,600 h.p., and the improved P. XI. R.C. 30, known as the R.C. 40, giving 1,000 h.p.

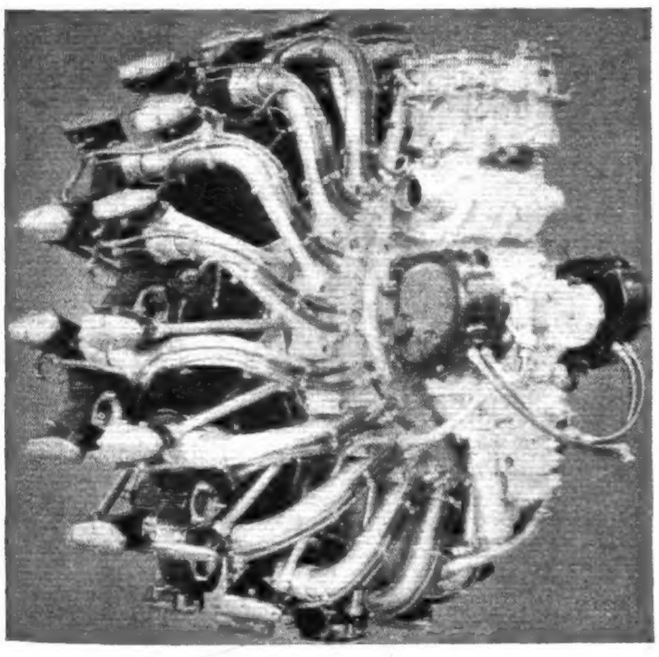
Primarily known for their liquid-cooled vee-twelve units, Isotta-Fraschini also figure in the radial market with their Astro model 140 R.C. 35 fourteen-cylinder radial which gives 770 h.p. at sea level and 820 h.p. at rated altitude. Two smaller seven-cylinder units, the fully supercharged 7 C. 40 (400 h.p. at 13,120 ft. at 2,000 r.p.m.) and the 7 C. 21, giving 420 h.p. at sea level, are also on view.



A Czechoslovakian exhibit, the Walter Sagitta has been greatly developed since its appearance at Paris. A 100-hour type test at 570 h.p. output has been completed, and as much as 650 h.p. has been taken from the engine in a special category. The fully supercharged Sagitta II R.C. "cannon-engine" at Milan has a normal rating of 520 h.p. at 13,450 feet.



A good idea of modern practice in the design of light inverted engines can be gained from this drawing of a sectioned German Argus As.10 C. engine. The inverted, air-cooled vee-eight layout is rather strange to British eyes but is used extensively in Germany. The maximum output is 240 h.p. Another well-known example of this class of engine is the Hirth HM. 508E.



"Doppia stella," "Doppelstern" (or double-star) motor, the Fiat A. 80 R.C.41 is an eighteen-cylinder geared and supercharged radial rated at 1,000 h.p. The *potenza ideale*, which corresponds to the French *équivalent de puissance*, is 1,630 h.p.

Gnôme-Rhônes show the very small diameter two-row M.14 engine which created a stir on its first appearance at the last Paris Show. It is rated at 680 h.p. at 13,100 ft. A new large two-row engine, the P.18, presumably a modified L.18, is rated at 1,600 h.p. at 2,300 r.p.m. and 14,760 ft. The take-off power is given at 1,650 h.p.

Although Italy boasts no "X"- or "H"-type engines, there are several of "vee" layout and inverted-vee units of German and Czechoslovakian manufacture are represented. The names of Fiat and Isotta-Fraschini come to mind at once in the large liquid-cooled twelve-cylinder field. Air-cooled Pratt and Whitney engines are built under licence by Fiat, but in design the unsupercharged V-12 A.30 RA (bis) follows Fiat principles of long standing.

The Junkers Jumo 210 inverted vee-twelve unit has now been joined by a larger model, the Jumo 211. This has a reduction gear of spur type. Its take-off output is claimed to be 1,100 h.p. At altitude the maximum is 945 h.p.

The orthodox 12 Y crs. liquid-cooled Hispano-Suiza appears unchanged, while the Walter Sagitta models have improved ratings. The moderately supercharged Sagitta I